

8.1. ANTIFUNGAL AGENTS

8.1.1. Introduction

Fungi are neither plants nor animals, and are classified as their own kingdom. Fungi grow either as **yeasts** (single round cells) or as **moulds** (many cells forming long, thin threads called hyphae). Some fungi even go through both the forms during their life cycle. Many fungi, including bread moulds and mushrooms, can be seen with the naked eye. Fungal infections are often caused by fungi present in the environment. Most fungi are not dangerous, but some of them can be harmful.

Fungal spores are present in the air or in soil, thus fungal infections begin mostly in the lungs or on the skin. These infections progress slowly and are not serious, unless they weaken the immune system. Antifungal drugs used to treat fungal infections are either applied topically on the infected site or are taken orally or injected in case the infection is serious.

Table 8.1 enlists some commonly used antifungal drugs:

Table 8.1: Potentially Effective Antifungal Compounds

Diseases	Compounds
Dermatophytoses	Azoles (Butoconazole, Clotrimazole, Econazole, Itraconazole, Miconazole, Oxiconazole, Sulconazole); Griseofulvin; Naftifine; Terbinafine; Tolnaftate.
Aspergillosis	Amphotericin B \pm 5-Fluorocytosine, Itraconazole.
Blastomycosis	Amphotericin B, Itraconazole, Ketoconazole.
Candidiasis	Amphotericin B \pm 5-Fluorocytosine; Nystatin; Azoles (Butoconazole, Clotrimazole, Econazole, Fluconazole, Itraconazole, Ketoconazole, Miconazole, Terconazole, Tioconazole).
Chromomycosis	5-Fluorocytosine, Itraconazole, Ketoconazole.
Coccidioidomycosis	Amphotericin B, Fluconazole, Itraconazole, Ketoconazole.
Cryptococcosis	Amphotericin B \pm 5-Fluorocytosine, Fluconazole.
Histoplasmosis	Amphotericin B, Itraconazole, Ketoconazole.
Mucormycosis	Amphotericin B.
Paracoccidioidomycosis	Itraconazole, Ketoconazole.
Pneumocystosis	Trimethoprim/Sulphamethoxazole, Pentamidine isethionate, LY-303, 366, Deferoxamine.
Pseudallescheriasis	Amphotericin B, Miconazole.
Sporotrichosis	Amphotericin B, Itraconazole, Potassium iodide.

8.1.2. Classification

The antifungal drugs are classified as follows:

- 1) **Antibiotics**
 - i) **Polyenes:** Amphotericin B (AMB), Nystatin, Hamycin, and Natamycin (Pimaricin).
 - ii) **Heterocyclic Benzofuran:** Griseofulvin.
- 2) **Antimetabolite:** Flucytosine (5-FC).
- 3) **Azoles**
 - i) **Imidazoles (Topical):** Clotrimazole, Econazole, and Miconazole.
(Systemic): Ketoconazole.
 - ii) **Triazoles (Systemic):** Fluconazole and Itraconazole.
- 4) **Allylamine:** Terbinafine.
- 5) **Other Topical Agents:** Tolnaftate, Undecylenic acid, Benzoic acid, Quiniodochlor, Ciclopirox olamine, and Sodium thiosulfate.